Information
Services
Program
(ISP)

Information Systems Planning Report

Medical Sector

INPUT®

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INFORMATION SYSTEMS PLANNING REPORT

MEDICAL SECTOR

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Major Issues

Major Issues

The underlying business pressures that have been facing the medical industry for the past few years continue in 1987 and 1988. Increased focus on costs, quality of care, and competition within the health care area all continue to drive major changes in the management processes of this sector.

- These changes have created numerous and difficult challenges for the Information Systems departments as they strive to bring automation to all areas of health care, including many areas that have not been previously automated.

- INPUT has observed that, in 1987, the medical industry has moved from talking of strategic planning and marketing to actual implementation of new and expanded services, many of which require new and creative information management solutions.

While IS remains under pressure to contain costs, it is also receiving the same high priority afforded it in other industries. IS is being recognized as and being asked to perform like a strategic contributor. For example:

- IS is often viewed as the only means to help hospital management deal with the federal government's DRG-based payments program. Payments programs are an area in which success by the hospital industry has brought additional and more stringent federal reporting requirements.

- IS is being drawn into and becoming a significant factor in the implementation of a cohesive marketing strategy.

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- IS is a focal point for the evolution to cost-and-profit based management processes.

A Driving Forces

The dominant driving force in the medical and health care industry remains cost of delivery. Increasing costs in the face of growing competition and public and governmental pressure has drastically changed the focus of medical industry management and with it their information systems organizations. Being able to respond to changing government regulations and service offerings while maintaining the cost-effective delivery of services is a constant challenge for IS management.

Government regulations continue to be a major force in determining the priorities of medical sector IS programs. The accounting and reporting systems required to meet regulatory needs are large, complex, and undergoing frequent change. Because of this they are a major draw on IS resources. There is a need for new applications and for ongoing maintenance and enhancement.

Mergers and acquisitions of acute-care hospitals, specialized clinics, nursing homes, and laboratories are bringing a new dimension to the IS challenge. In many instances IS is finding a need to centralize operations and standardize application software to gain the necessary efficiencies and cost reductions.

Competition and the related marketing of services remains a strong influence. The midsized hospital must strive to differentiate itself to maintain its position, while the large institution must meet its competitors head-on with quality, low-cost care. The large hospital is using specialized services such as helicopter and emergency trauma service to build relationships with small city hospitals as a means to underwrite the cost of the service and improve the flow of patients to specialized services.

These driving forces are summarized in Exhibit I-1.

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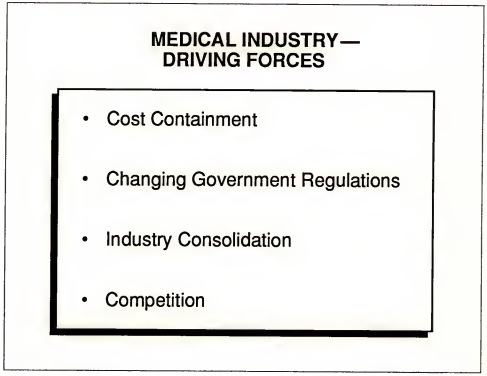
EXHIBIT I-1



B

Issues and Objectives

Exhibit I-2 summarizes the primary challenges for IS management in the medical sector. These challenges are not significantly changed from last year's report. The changes to note are:

- The need to support end-user computing needs has been dropped, not because the challenge has gone away, but because it is an objective for IS in all industries and one that is seeing measurable progress.

- The objective of automating laboratory systems has been added. This is a need driven by government regulation and cost containment. Laboratory automation has remained an area relatively unaddressed by IS in the past. Lab automation is also a major issue in the pharmaceutical industry, where tracking the testing of new drugs is essential.

The principle IS issue and challenge is still to organize the information of the medical institution to meet cost-effective management and external reporting requirements. Meeting this challenge is driving IS management to further integrate patient, accounting, and operating (purchasing and inventory) systems.

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EXHIBIT I-2

MEDICAL
ISSUES AND OBJECTIVES

Issue \ Objective	Cost Containment	Implement On-Line Accounting for Regulatory Reporting	Improve Confidentiality of Patient Information	Attract Physicians with Technology Innovation	Implement Integrated Patient Care Systems	Implement Automated Laboratory Systems
Cost Pressure	High	Does Not Apply	Medium	Does Not Apply	Medium	Medium
More-Complex Accounting Systems	Medium	Does Not Apply	High	Does Not Apply	Medium	Low
Centralized Patient Information	Medium	High	Medium	Medium	Medium	Medium
Provide Automated Tools to Assist/Attract Physicians	Does Not Apply	Medium	Medium	High	Medium	Medium
Automated Manual Processes to Improve Productivity	Medium	Does Not Apply	Low	Low	High	High
Regulatory Reporting Compliance	Medium	Low	Medium	Low	Medium	Medium

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The availability of software packages to address the DRG-based accounting requirements is helping. However, hospitals must decide whether to buy the solution or continue to develop an in-house, perhaps more integrated solution.

The focus on patient tracking and administrative systems continues as a key objective. These systems can contribute to the overall cost-effectiveness of the organization and simplify the interfaces with outsiders such as the insurance industry and the regulatory agencies. The underlying issues are confidentiality of patient information and the interfaces with supporting patient systems, such as the pharmacy and laboratory administrative systems.

There remain within this sector, in particular within hospital management, some processes that are still administered manually. These manual processes continue to offer IS an opportunity to contribute. In 1987 one area receiving much attention is laboratory testing.

The regulatory agencies continue to place significant pressure on the administrator and IS. To satisfy the reporting requirements in a timely fashion, end users are performing a growing part of the reporting process and are demanding significant support.

C

Impact of New Technology

Exhibit I-3 lists areas of computing technology currently having, or likely to have a direct impact on the medical sector.

End-user computing developed relatively recently within the medical sector. Now supported by organized and expanding support programs, end-user computing continues to be a focal point .

Distributed and departmental systems are a common and key element of hospital IS strategies.

- Many departments have existing processors used for scientific applications and in turn provide an opportunity for connection to office automation and electronic mail networks.

- End users are becoming involved with the local processing capability and, as in other industries, beginning to develop their own applications. This trend, which will develop over the next three years, will lead to a control problem for IS management.

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EXHIBIT I-3

MEDICAL INDUSTRY
AREAS OF INTEREST - NEW TECHNOLOGY

- End-User Computing
- Networking with Outside Organizations
- Scientific Computing
- Medical Technology
- Distributed and Departmental Systems
- LANs
- Relational Data Base Management Systems
- Voice/Data - Integration

There is a growing interest in connecting information systems with outside organizations, including affiliated supporting clinics, private-physician offices, claims processors, and others. This new interest will create new telecommunications challenges for IS, while providing additional opportunities to contribute to cost-effectiveness.

Hospitals continue to have a high and pervasive interest in new medical technology. Today much of that technology is information systems related, thus offering IS an opportunity to contribute directly to the quality of health care. Senior management needs to draw IS management into this area to assure the compatibility of the medical-related technology and to gain the insights of IS.

Relational data base technology is gaining interest in the medical sector; however, less that 25% of those surveyed were planning to implement this technology in the near term. This situation was true for small, medium, and large hospitals.

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LAN technology has a high level of interest in this sector, perhaps due to the existence of many professional users and departmental processors. However, the lack of standards is delaying progress. IS will need to take a proactive position to move this technology forward.

The merging of voice and data communications remains a low priority (less than 10% of respondents). A principle reason is that many medical-sector organizations are either in a single location or within a small radius.

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New Applications

II

New Applications

A

Application Areas

The focus of application development programs within this industry is in the areas listed in Exhibit II-1.

EXHIBIT II-1

MEDICAL SECTOR
PRIORITY APPLICATION AREAS
1987

- Accounting/Payment Systems
- Marketing Systems
- Patient Care Systems

1. Accounting/Payment Systems

Accounting remains the major application area in the medical field.

- Accounting systems must be tailored to meet the DRG reporting and payment requirements imposed by the federal government. Although the requirement for these systems became effective in October, 1986,

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the lack of third-party software until recently has hampered the rate of installation.

- The goal of improving payment systems and the communication between payment sources (insurance companies and governmental agencies) is generating interest in Electronic Document Interchange (EDI) technology.

- INPUT noted a number of sites converting from Motorola/Four Phase Systems to DEC- and IBM-based integrated financial systems due to the age of the former systems and concern about their long-term viability.

2. Marketing Systems

Marketing is becoming the medical industry buzzword and is the area with the greatest unmet information needs. Medical organizations are now forced to develop and apply marketing techniques to more effectively compete. Access to demographic, utilization, and profit margin (by type of service) information has become essential.

- Hospitals are trying to better understand the demographics of their patient base and want to learn how to better serve the physicians who refer patients as well as physicians on staff. Application software that correlates demographic information with patient profiles, physician data, and facility utilization is an area of new focus. However, up-to-date accounting software must often be installed first because the data required for today's marketing systems is provided from these operating systems.

- Marketing information is also important to blood banks and specialized clinics where services are now aggressively marketed to affiliated hospitals and physicians. Understanding and "marketing" to the limited stock of blood donors is also an area of importance. Blood banks are also investigating automated testing and inventory-tracking systems to reduce costs and better manage their fragile product.

3. Patient Care Systems

Patient care systems continue to play an important role and demand a significant portion of IS development resources. This has been an area of opportunity for third-party software vendors, but seems to remain a priority of the in-house development staff. Rightly or wrongly the orientation to patient information tracking seems to vary significantly across the industry, making it difficult to purchase a system.

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4. Other Application Areas

Other areas of priority include pharmacy, radiology, and materials management, including a growing use of personal-computer-based production systems in laboratories, in supply rooms, and on the hospital floor to track supplies and patient care.

A final factor in the application area is the move toward mergers and acquisitions. This move is causing a trend towards centralization of information processing to gain integration of accounting processes and access to economies of scale in processing.

B

Development Resource Allocation

In 1987 nearly half all of large medical organizations began to move from custom development to the purchase of third-party software. These choices are dictated by changing economies of scale, the true cost of software enhancements and maintenance, the aging of existing systems, and the recent availability of more complete and integrated application software. These new systems are being developed by larger, financially stable vendors, whereas in the past third-party suppliers were smaller and less dependable.

The emphasis on External Development Resources reflected in Exhibit II-2 has always been significant. Historically, due to the smaller size of health care industry IS functions and the specialized nature of many of the applications, there has been a dependence on outside development companies. Many of these firms are now moving to provide more-complete package solutions (versus customized solutions). The trend is projected to continue.

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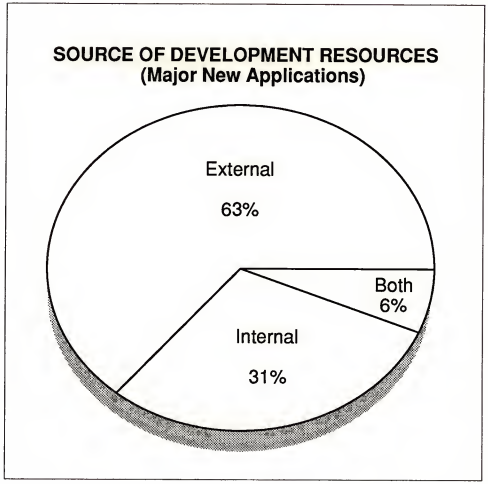
EXHIBIT II-2



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Budget Analysis

Budget Analysis

Exhibit III-1 shows the distribution of IS budgets for those organizations interviewed, including the projected change by budget category in 1988 over 1987. The forecasted changes are modest in all categories.

IS budgets for medical organizations (including hospitals, physician practices, blood banks, and independent laboratories) are expected to grow by a modest 1.2% in 1988 over 1987. Cost-containment continues to pressure the IS budget in spite of the conflicting pressure for additional systems.

Planned expenditures in hardware exceed those expected in software and services. Hardware expenditures are rising because installed CPUs are at capacity and new, larger integrated applications are demanding more processing power and storage.

Within the hardware budget, the expenditures for microcomputers and mainframes are expected to grow faster than those for minicomputers. Consolidation among hospitals is one force affecting the growth in mainframe installations. When two or more medium-sized hospitals merge, two minicomputers are replaced by a mainframe to gain economies of personnel and consolidation of applications and data bases.

The 10.3% budget allocation to External Software supports the comments earlier about the use of outside developers and package software. The typical allocation in other industries is about 6%.

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EXHIBIT III-1

1987 BUDGET DISTRIBUTION AND 1987/1988 CHANGES IN THE MEDICAL SECTOR

BUDGET CATEGORY	1987 PERCENT OF I.S. BUDGET	1987-1988 EXPECTED BUDGET GROWTH
Personnel Salaries and Fringes	39.6	3.2
Mainframe Processors	7.7	2.9
Minicomputers	5.6	1.0
Microcomputers	2.5	3.6
Mass Storage Devices	3.4	2.7
Other Hardware	7.9	(1.5)
Total Hardware	27.1	1.3
Data Communications	8.3	2.1
External Software	10.3	3.4
Professional Services	0.9	0.9
Turnkey Systems	2.7	0.4
Software Maintenance	1.5	1.3
Hardware Maintenance	5.4	(2.8)
Outside Processing Services	0.1	0.0
Other	4.1	(2.2)
Total Software and Services	33.3	0.9
Grand Total	100	1.2

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Exhibit III-2 shows the magnitudes and rates of budget change among the respondents.

- The percentage of IS budgets projected to be higher in 1988 is only 41% compared to 79% in 1987's projection. This decline can be attributed to continued cost containment programs and to a focus on implementation versus launching major new programs.
- Of budgets that are growing, 57% are growing at a lower rate than last year's projection. Again this slower growth is a result of emphasizing the focus on costs.

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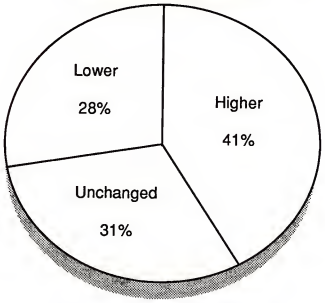
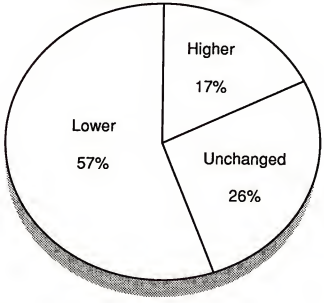
EXHIBIT III-2

MEDICAL SECTOR
BUDGET CHANGE ACTIVITY

Comparison of 1988 and 1987 IS Budgets
(Percent of Respondents)



Comparison of Changes in Growth Rates,
1988 - 1987
(Percent of Respondents)



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About INPUT

INPUT provides planning information, analysis and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

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